H-A

Notice of Allowability	Application No.	Applicant(s)	
	10/718,707	RAMSBEY ET AL.	
	Examiner	Art Unit	
	Khanh B. Duong	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed July 28, 2005*.

2. ☒ The allowed claim(s) is/are *10-21*.

3. ☒ The drawings filed on *24 November 2003* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Michael Trinh
Primary Examiner

DETAILED ACTION

Response to Amendment

This Office Action is in response to the amendment filed on July 28, 2005.

Accordingly, claims 10, 11 and 15-18 were amended.

Currently, claims 10-21 remain pending in the application.

Terminal Disclaimer

The terminal disclaimer filed on July 28, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S Patent No. 6,001,713 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

Claims 10-21 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record, taken alone or in combination, discloses all the features as claimed.

Re claim 10, none of the prior art of record discloses a method for forming a semiconductor device comprising the steps of: forming a silicon nitride film on the second dielectric layer; and then forming a first nitrogen-rich region within the first gate and substantially adjacent to the first dielectric layer, and a second nitrogen-rich region within the first gate and substantially adjacent the second dielectric layer, wherein the silicon nitride film is formed on the second dielectric layer prior to the step of forming the first nitrogen-rich region and the second nitrogen-rich region within the first gate.

Re claim 11, none of the prior art of record discloses a method for forming a semiconductor device comprising the steps of: forming a second dielectric layer on the first gate;

and then forming a first nitrogen-rich region within the first gate and substantially adjacent to the first dielectric layer, and a second nitrogen-rich region within the first gate and substantially adjacent the second dielectric layer, wherein the step of forming the first nitrogen-rich region and the second nitrogen-rich region within the first gate further comprises: implanting nitrogen ions through the second dielectric layer and into the first gate, the implanted nitrogen ions forming a first nitrogen concentration profile within the first gate; and causing the first nitrogen concentration profile to be altered to form a second nitrogen concentration profile within the first gate, the second nitrogen concentration profile comprising the first nitrogen-rich region, the second nitrogen-rich region and a contiguous reduced-nitrogen region located between the first nitrogen-rich region and the second nitrogen-rich region, the contiguous reduced-nitrogen region having a lower concentration of nitrogen than the first nitrogen-rich region and the second nitrogen-rich region.

Re claim 21, none of the prior art of record discloses a method for forming a semiconductor device comprising the steps of: implanting nitrogen through the overlying dielectric layer and substantially into a polysilicon layer; and heating the polysilicon layer to cause the implanted nitrogen to form a first nitrogen-rich region substantially adjacent to the underlying dielectric layer and a substantially separate second nitrogen-rich region substantially adjacent the overlying dielectric layer, thereby leaving a reduced-nitrogen region located within the polysilicon layer between the first nitrogen-rich region and the second nitrogen-rich region, wherein the reduced-nitrogen region always has a lower concentration of nitrogen than the first nitrogen-rich region and the second nitrogen-rich region.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Thursday (9:00 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KBD

Michael Trinh
Primary Examiner
Act SPE